Generative Adversarial Networks for Image and Video Synthesis: Algorithms and Applications

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Abstract

The generative adversarial network (GAN) framework has emerged as a powerful tool for various image and video synthesis tasks, allowing the synthesis of visual content in an unconditional or input-conditional manner. It has enabled the generation of high-resolution photorealistic images and videos, a task that was challenging or impossible with prior methods. It has also led to the creation of many new applications in content creation. In this article, we provide an overview of GANs with a special focus on algorithms and applications for visual synthesis. We cover several important techniques to stabilize GAN training, which has a reputation for being notoriously difficult. We also discuss its applications to image translation, image processing, video synthesis, and neural rendering.